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EXAMINER	
CULLEN, SEAN P	

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1725	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/593,187	CORDELLE ET AL.	
	Examiner	Art Unit	
	Sean P. Cullen, Ph.D.	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 September 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/03/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 3, 2010 has been entered.

Status of Claims

2. **Claims 1-21** are pending.

Response to Amendment

3. The amendment to the claims filed on December 3, 2010 does not comply with the requirements of 37 CFR 1.121(c) because **claim 2, 6 and 16** use the identifier "previously amended" and **claim 19** uses the identifier "as amended." In the claim listing, the status of every claim must be indicated after its claim number by using one of the following identifiers in a parenthetical expression: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New), and (Not entered). **Claims 2, 6 and 16** should use the identifier "Previously Presented" and **claim 19** should use "Currently Amended." Amendments to the claims filed on or after July 30, 2003 must comply with 37 CFR 1.121(c).

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the each gas inlet defining passages through the cell in direct contact with the electrode layer to which each gas inlet is dedicated for enabling gas transfer through the electrode layers must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. **Claims 1-21** are objected to because of the following informalities:

Regarding **claims 1-21**, where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. See 37 CFR 1.75(i).

Regarding **claims 1-21**, claims should begin with "A", "An", or "The."

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 1-18** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "the two electrode layers consisting of an anode and a cathode." The transitional phrase "consisting of" excludes any element, step, or ingredient not specified in the claim. This limitation excludes any other element in the electrode layers. The claim further recites "at least one of two electrode layers having at least a first compact zone ... wherein the first compact zone is a protuberance of the electrolyte layer." The electrolyte layer is not a cathode or an anode. The claims use inclusive and exclusive transitional phrases to limit the electrode layers. The Examiner recommends "the two electrode layers comprising an anode and a cathode."

Claims 2-18 are ultimately dependent from **claim 1** and included all the limitations of **claim 1**. Therefore, **claim 2-18** are also indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation "the densified material" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 21 recites "wherein said first compact zone is composed of the densified material from which the electrode including the said compact zone is made." Claim 1 recites "wherein the first compact zone is a protuberance of the electrolyte layer." It is unclear how the first compact zone is a protuberance of the electrolyte layer yet is composed of the same material as the electrode.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. **Claims 1-10 and 16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruhl (U.S. 4,770,955 A) in view of Itoh (U.S. 2004/0175607 A1).

Regarding **claim 1**, Ruhl discloses an individual cell for a fuel cell (1) comprising:

- first (5) and second electrode layers (4) and
- separate gas inlets (11 and 14) dedicated to each of said electrode layers respectively (4 and 5, Fig. 1) with each gas inlet (11 and 14) defining passages (11 and 14) through the cell (1) in direct contact with the electrode layer (4 and 5) to which each gas inlet (11 and 14) is dedicated for enabling gas transfer through the electrode layers (4 and 5, Fig. 1, C4/L42-56) with
- said electrode layers having a first (C3/L43-61) and a second porosities (C4/L11-32), and further comprising

- a solid electrolyte layer (6) located between the two electrode layers (4 and 5, Fig. 1),
- the two electrode layers (4 and 5) consisting of an anode (4) and a cathode (5, Fig. 1),
- at least one of the two electrode layers (4 and 5) having at least a first compact zone (7 and 8, Fig. 1) with a third porosity (C3/L62-C4/L10),
- which is lower than the porosity of the electrode layer (4 and 5) in which the first compact zone (7 and 8, Fig. 1) is located (C3/L62-C4/L10),
- wherein the first compact zone (7 and 8) is a protuberance of the extending into said electrode layer (4 and 5) for forming an area of low porosity disposed adjacent the gas inlet (11 and 14) dedicated to the other electrode layer (4 and 5, Fig. 1).

Ruhl does not explicitly disclose:

- a protuberance of the electrolyte layer

Itoh discloses solid oxide fuel cell (abstract) comprising a compact zone (8b), which is a protuberance (8b) of the electrolyte layer (7, Fig. 2) to seal an electrode layer (2) to form a seal from a single component [0019] to reduce the number of parts [0025], the cost of manufacturing [0016] and increase the strength of the fuel cell stack [0025]. Ruhl and Itoh are analogous art because they are directed to solid oxide fuel cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the individual fuel cell of Ruhl with the protuberance of Itoh to form a seal from a single component to reduce the number of parts, the cost of manufacturing and increase the strength of the fuel cell stack.

Regarding **claim 2**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- the first electrode layer (5) has a first thickness (Fig. 1) and
- said first compact zone (7) has a thickness identical to the first thickness (Fig. 1).

Regarding **claim 3**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the second electrode layer (4) comprises at least a second compact zone (8) with a fourth porosity (C3/L62-C4/L10),
- the fourth porosity being lower than the second porosity (C3/L62-C4/L10).

Regarding **claim 4**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the second electrode layer (4) has a second thickness (Fig. 1), and
- a second compact zone (8) has a thickness identical to the second thickness (Fig. 1).

Regarding **claim 5**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the first electrode layer (5) has a first thickness (Fig. 1) and
- a first compact zone (7) has a thickness identical to the first thickness (Fig. 1).

Regarding **claim 6**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein a second compact zone (8) is composed is a protuberance

Ruhl does not explicitly disclose:

- a protuberance of the electrolyte layer

Itoh discloses solid oxide fuel cell (abstract) comprising a compact zone (8b), which is a protuberance (8b) of the electrolyte layer (7, Fig. 2) to seal an electrode layer (2) to form a seal from a single component [0019] to reduce the number of parts [0025], the cost of manufacturing [0016] and increase the strength of the fuel cell stack [0025]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the individual fuel cell of modified Ruhl with the protuberance of Itoh to form a seal from a single component to reduce the number of parts, the cost of manufacturing and increase the strength of the fuel cell stack.

Regarding **claim 7**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- at least one bipolar plate (2) adjacent to an electrode layer (5, Fig. 1).

Regarding **claim 8**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- two bipolar plates (2 and 3) adjacent to each electrode layer (4 and 5, Fig. 1).

Regarding **claim 9**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the bipolar plate (2 and 3) has a coefficient of thermal expansion (C2/L48-C3/L12) higher than the coefficient of thermal expansion of the adjacent electrode layer (4 and 5) and the electrolyte layer (6, C3/L43-C4/L32).

Regarding **claim 10**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the bipolar plate (2 and 3) is connected to the adjacent electrode layer ($ and 5) by nesting (Figs. 1 and 3, C2/L48-C3/L12).

Regarding **claim 16**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- comprising at least a first gas inlet (14) dedicated the cathode (5) such that the entire area of the anode (4) adjacent to said first gas inlet (14) is a compact area (8) of the anode (4, Fig. 1)
- at least a second gas inlet (11) dedicated to the anode (4) such that the entire area of the cathode (5) adjacent to each second gas inlet (11) is a compact area (7) of the cathode (5).

Regarding **claim 17**, modified Ruhl discloses all claim limitations set forth above and further discloses a fuel cell comprising:

- a stack of cells (20)
- each cell being separated from its neighbor by a bipolar plate (2 and 3, Figs. 1 and 3).

Regarding **claim 18**, modified Ruhl discloses all claim limitations set forth above and further discloses a fuel cell:

- with a circular plane geometry (Fig. 2).

10. **Claims 11-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruhl (U.S. 4,770,955 A) in view of Itoh (U.S. 2004/0175607 A1) as applied to claim 10 above, and further in view of Fischer et al. (U.S. 3,554,808 A).

Regarding **claims 11, 12, 14 and 15**, modified Ruhl discloses all claim limitations set forth above and further discloses an individual cell:

- wherein the compact zone (7 and 8) is adjacent to the gas inlet (11 and 14).

Ruhl does not explicitly disclose:

- wherein the bipolar plate comprises at least a protuberance and
- the adjacent layer comprises a cavity,
- said protuberance of the bipolar plate and the cavity fitting one into the other.
- wherein the cavity is located in an adjacent to the gas inlet of the electrode layer.
- wherein the cavity is larger in width than the width of the protuberance of the bipolar plate.
- comprising a plurality of cavities.

Fischer et al. discloses a solid oxide fuel cell (abstract) wherein a bipolar plate (5') comprises at least one protuberance (Fig. 4) and the adjacent layer (4') comprises a cavity (15), said protuberance (Fig. 4) of the bipolar plate (5') and the cavity (15) fitting one into the other (Fig. 4); wherein the cavity (15) is located in a adjacent to the gas inlet (18) of the electrode layer (4'); wherein the cavity (15) is larger in width than the width of the protuberance (Fig. 4) of the bipolar plate (5');.and comprising a plurality of cavities (Fig. 4) to produce a gas tight fuel cell (C4/L3-20) to increase the efficiency of the fuel cell stack. Ruhl and Fischer et al. are analogous art because they are directed to solid oxide fuel cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the individual cell of modified Ruhl with the protuberance and cavity of Fisher et al. to produce a gas tight fuel cell to increase the efficiency of the fuel cell stack.

Regarding **claim 13**, modified Ruhl discloses all claim limitations set forth above, but does not explicitly disclose an individual cell:

- wherein the cavity is located in a protuberance of the electrolyte layer.

Itoh discloses solid oxide fuel cell (abstract) comprising a compact zone (8b), which is a protuberance (8b) of the electrolyte layer (7, Fig. 2) to seal an electrode layer (2) to form a seal from a single component [0019] to reduce the number of parts [0025], the cost of manufacturing [0016] and increase the strength of the fuel cell stack [0025]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the individual fuel cell of modified Ruhl with the protuberance of Itoh to form a seal from a single component to reduce the number of parts, the cost of manufacturing and increase the strength of the fuel cell stack.

11. **Claims 19 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruhl (U.S. 4,770,955) in view of Fischer et al. (U.S. 3,554,808).

Regarding **claim 19**, Ruhl discloses an individual cell comprising:

- an anode layer (4),
- a cathode layer (5), and having
- a solid electrolyte layer (6) located between the anode layer (4) and the cathode layer (5, Fig. 1),
- separate gas inlets (11 and 14) dedicated to each of said electrode layers respectively (4 and 5, Fig. 1) with each gas inlet (11 and 14) defining passages (11 and 14) through the cell (1) in direct contact with the electrode layer (4 and 5)

to which each gas inlet (11 and 14) is dedicated for enabling gas transfer through the electrode layers (4 and 5, Fig. 1) with

- a bipolar plate (2 and 3) adjacent to each of the anode (4) and cathode layer (5, Fig. 1),
- each of the anode (4) and cathode layer (5)comprising a dense zone (7 and 8) having a thickness equal to the thickness of the corresponding anode (4) and cathode layer (5, Fig. 1)
- the porosity of the dense zone (7 and 8) being larger than the porosity of the corresponding anode (4) and cathode layer (5, C3/L62-C4/L10),
- wherein the compact zone (7 and 8) is adjacent to the gas inlet (11 and 14).

Ruhl does not explicitly disclose:

- the dense zone comprising a cavity adjacent to the gas inlet wherein a corresponding protuberance of the adjacent bipolar plate can fit.

Fischer et al. discloses a solid oxide fuel cell (abstract) wherein a cavity (15) adjacent to the gas inlet (18) wherein a corresponding protuberance (Fig. 4) of the adjacent bipolar plate (5') can fit (Fig. 4) to produce a gas tight fuel cell (C4/L3-20) to increase the efficiency of the fuel cell stack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the individual cell of modified Ruhl with the protuberance and cavity of Fisher et al. to produce a gas tight fuel cell to increase the efficiency of the fuel cell stack.

With respect to claim 20, as instant specification is silent to unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the protrusion of Fischer et al. into the dense zone of Ruhl, since such modification

would have involved making elements integral. Making elements integral is generally recognized as being within the level of ordinary skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Regarding claim 20, modified Ruhl discloses all claim limitations set forth above and further discloses:

- comprising gas inlets (11 and 14) for one of the anode (4) and cathode (5) located in dense zones (7 and 8) of the other anode (4) and cathode (5, Fig. 1).

12. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruhl (U.S. 4,770,955 A) in view of Itoh (U.S. 2004/0175607 A1) as applied to claim 1 above, and further in view of Shibata et al. (U.S. 2004/0058223 A1).

Regarding **claim 21**, modified Ruhl discloses all claim limitations set forth above, but does not explicitly disclose an individual cell:

- wherein said first compact zone is composed of the densified material from which the electrode including the said compact zone is made.

Shibata et al. discloses a first compact zone (23A) is composed of a densified material (see compressed, [0041]) which the electrode including the said compact zone is made (see electrode portions, [0041]) to allow the gas channel to retain good gas diffusibility and water permeability ([0042]). Ruhl and Shibata et al. are analogous art because they are directed to fuel cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the compact zone of modified Ruhl with a densified material of the electrode

as taught by Shibata et al. to allow the gas channel to retain good gas diffusibility and water permeability.

Response to Arguments

13. Applicant's arguments filed December 3, 2010 with respect to **claims 1-18** have been fully considered but they are not persuasive.

Regarding applicants' argument that the fuel (hydrogen) in tube 11 cannot directly contact cathode 5 and the fuel (oxygen) in tube 14 will not contact the anode 4, the hydrogen tube 11 is not the separate gas inlet dedicated to said cathode 5 and the oxygen tube 14 is not the separate gas inlet dedicated to said anode 4. Ruhl explicitly discloses that the tube 14 supplies oxygen to the cathode 5 (C4/L42-56) and tube 11 supplies gaseous fuel to the anode 4 (C4/L42-56). The hydrogen tube 11 is the separate gas inlet dedicated to said anode 4 and the oxygen tube 14 is the separate gas inlet dedicated to said cathode 5. Ruhl also explicitly discloses that oxygen in tube 14 directly contact the cathode 5 (Fig. 1) and the hydrogen in tube 11 directly contact the anode 4 (Fig. 1, C4/L42-56). It is also well known in the solid oxide fuel cell art that hydrogen is supplied to the anode and oxygen is supplied to the cathode. Therefore, Ruhl discloses separate gas inlets dedicated to each of said electrode layers respectively with each gas inlet defining passages through the cell in direct contact with the electrode layer to which each gas inlet is dedicated for enabling gas transfer through the electrode layers.

Regarding applicants' argument that gasket 8 is disposed between the separator 3 and the electrolyte 6 to form substantially gas-tight seals to protect anode 4 from oxygen within the tube 14, Ruhl explicitly discloses that gaseous fuel (hydrogen) is supplied to the anode (C4/L42-56)

and tube 14 provides oxygen to the cathode (C4/L42-56). Therefore, the tube 14 is the separate gas inlet dedicated to the cathode.

Regarding applicants' argument that fuel in tube 11 cannot directly contact cathode 5, Ruhl explicitly discloses that oxygen is supplied to the cathode (C4/L42-56) and tube 11 provides hydrogen to the anode (C4/L42-56). Therefore, the tube 11 is the separate gas inlet dedicated to the anode.

Regarding applicants' argument that the gas inlets 11 and 14 in Ruhl are not designed to define passages through the cell in direct contact with the electrode layers to which each of the gas inlets are dedicated, the Examiner respectfully disagrees. It is well known in the solid oxide fuel cell art that hydrogen is supplied to the anode and oxygen is supplied to the cathode. Ruhl discloses a tube (11) supplies hydrogen to an anode (4, C4/L42-56) and the tube (11) is in direct contact with the anode (4, Fig. 1). In other words, the tube (11) is dedicated to and in direct contact the anode (4). Ruhl also discloses a separate tube (14) supplies oxygen to a cathode (5, C4/L42-56) and the separate tube (14) is in direct contact with the cathode (5, Fig. 1). In other words, the separate tube (14) is dedicated to and in direct contact with the cathode (5). Therefore, the gas inlets 11 and 14 in Ruhl are designed to define passages through the cell in direct contact with the electrode layers to which each of the gas inlets are dedicated.

Regarding applicants' argument that Ruhl is using gaskets 7 and 8 to prevent the passages from directly contacting the electrode layers to which each of the gas inlets are dedicated, the Examiner respectfully disagrees. Ruhl discloses a gasket (7) that prevents hydrogen, which is supplied to the anode in tube 11 (i.e., dedicated to the anode), from contacting the cathode (5, Fig. 1). Ruhl discloses a separate gasket (8) that prevents oxygen, which is supplied to the

cathode in tube 14 (i.e., dedicated to the cathode), from contacting the anode (4, Fig. 1). Therefore, the gaskets 7 and 8 are used to prevent the passages from directly contacting the electrode layers to which each of the gas inlets are not dedicated.

Regarding applicants' argument that the externally located gas inlets do not define or form (internal) passages (2) as shown in Fig. 2 of the subject invention for direct gas contact with the electrode layer to which each gas inlet is dedicated as required in claim 1 to facilitate gas transfer through the electrode layers, note that while Itoh does not disclose all the features of the present claimed invention, Itoh is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), In re Keller 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely seals (i.e. gaskets) of gas inlets can be formed from protuberances of the electrolyte layer, and in combination with the primary reference, discloses the presently claimed invention.

Regarding applicants' argument that there is nothing in the teaching of Itoh which teaches or suggest forming a protuberance of the electrolyte layer, the Examiner respectfully disagrees. Itoh explicitly discloses that the electrolyte layer (3) consists of an electrolyte portion (7, [0047]) and a seal portion (8, [0045]) and the seal portion (8) consists of a corner film portion (8b) and an edge film portion (8a). Itoh also discloses that the seal portion (8) is part of the electrolyte (3, [0045]). This is clearly illustrated in Fig. 5 of Itoh where the electrolyte (3) consists of a seal portion (8) and an electrolyte film (7). Itoh further discloses that the seal portion (8) is a protuberance of the electrolyte layer (3, Fig. 5). Therefore, Itoh teaches, suggests and explicitly discloses forming a protuberance of the electrolyte layer.

Regarding applicants' argument that the seal portion 8 or corner film portion 8(b) are not part of the electrolyte and do not form a protuberance of the electrolyte, the Examiner respectfully disagrees. Itoh recites "at least one part of the electrolyte film 3 ... is a seal portion." Itoh explicitly discloses that the electrolyte layer (3) consists of an electrolyte portion (7, [0047]) and a seal portion (8, [0045]) and the seal portion (8) consists of a corner film portion (8b) and an edge film portion (8a). Itoh also clearly illustrates the seal portion and corner film are part of the electrolyte in Figs. 2-5. Therefore, the seal portion 8 and corner film portion (8b) are part of the electrolyte and form a protuberance of the electrolyte.

Regarding applicants' argument that Itoh does not disclose a protuberance of the electrolyte layer, Itoh explicitly discloses a protuberance of the electrolyte layer as detailed above.

Regarding applicants' argument that the seal portion 8 in Itoh is used to seal the electrolyte film 4 not to form a protuberance of the electrolyte layer, Itoh recites

> the seal portion includes a side film portion which covers each area of one of two pairs of opposed side surface of the porous fuel electrode substrate 2 and performs gas seal of those side surfaces, and a corner film portion 8b which covers both end portion of the other pair of opposed side surfaces of the porous fuel electrode substrate 2 close to the former pair of opposed side surfaces and performs gas seal of a part between these both end portions except a gas inflow/outflow opening 18.

Itoh explicitly discloses that the seal portion in Itoh is used to seal the electrode. Itoh also discloses that the seal portion is part of the electrolyte and forms a protuberance of the electrolyte as detailed above. Therefore, the seal portion 8 in Itoh is not used to seal the electrolyte film 4 and forms a protuberance of the electrolyte.

Regarding applicants' argument that the seal portion in Itoh does not extend into the electrode layer, Itoh discloses that the corner film portion (8a) covers the side surface of the fuel

electrode (2, Figs 1-6, [0046]). Itoh also discloses that the corner film portions (8a) extend into the fuel electrode (Figs. 1-6). The corner film portions are part of the electrolyte as detailed above. Therefore, the seal portion in Itoh extends into the electrode layer.

Regarding applicants' argument that Itoh does not teach a cell for a fuel cell which has a self-tight fuel cell architecture (no sealing gaskets), it is noted that the features upon which applicant relies (i.e., which has a self-tight fuel cell architecture (no sealing gaskets)) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding applicants' argument that Itoh does not teach each gas inlet defines passages through the cell in direct contact with the electrode layer located between the two electrode layers having a protuberance representing a fist [sic] compact zone formed by at least one of the two electrode layers for extending into such electrode layer for forming an area of low porosity disposed adjacent the gas inlet dedicated to the other electrode layer, note that while Itoh does not disclose all the features of the present claimed invention, Itoh is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, In re Nievelt, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), In re Keller 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely seals (i.e. gaskets) of gas inlets can be formed from protuberances of the electrolyte layer, and in combination with the primary reference, discloses the presently claimed invention.

Regarding applicants' argument that claims 2-10 and 16-18 depend from claim 1 and are patentable for the same reasons given above, claim 1 is not patentable as detailed above.

Regarding applicants' argument that Fischer is totally silent with regard to the subject of forming a tight seal around the channels through the fuel stack and is silent as regards a protuberance of a bipolar plate, this argument fails to comply with 37 CFR 1.111(b) because it amounts to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Regarding applicants' argument that Fischer is totally silent as regards a protuberance of a bipolar plate, Fischer discloses a gas-tight electron conducting layer (5) with protuberances (Fig. 4). The gas-tight electron conducting layer (5) is between the electrodes (2 and 4) and acts as a separator and/or bipolar plate. Therefore, Fischer is not totally silent as regards a protuberance of a bipolar plate.

Regarding applicants' argument that claims 11-15 depend from claim 1 and are patentable for the same reasons given above, claim 1 is not patentable as detailed above.

Regarding applicants' argument that Ruhl does not teach separate gas inlets dedicated to each of the electrode layers respectively with each gas inlet defining passages through the cell in direct contact with the electrode layer to which each gas inlet is dedicated for enabling gas transfer through the electrode layers, Ruhl explicitly discloses separate gas inlets dedicated to each of the electrode layers respectively with each gas inlet defining passages through the cell in direct contact with the electrode layer to which each gas inlet is dedicated for enabling gas transfer through the electrode layers as detailed above.

Regarding applicants' argument that Fischer is totally silent with regard to the subject of tightness around the channels 17 through the fuel cell stack, it is noted that the features upon which applicant relies (i.e., tightness around the channels through the fuel cell stack) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Regarding applicants' argument that Fischer does not teach forming a protuberance from a bi-polar plate, Fischer discloses forming a protuberance from a bi-polar plate as detailed above.

Regarding applicants' argument that Fischer does a protuberance from a b-polar plate to fit within a cavity formed by a dense zone of each of the anode and cathode layers, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Further, it as been held that making elements integral is generally recognized as being within the level of ordinary skill in the art. In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

14. Applicant's arguments with respect to **claim 21** have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Cullen, Ph.D. whose telephone number is 571-270-1251. The examiner can normally be reached on Monday thru Thursday 6:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on 571-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. P. C./
Examiner, Art Unit 1725

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1725